PATENT SPECIFICATION

589,918

Application Date: Nov. 28, 1944. No. 23748/44.

Complete Specification Accepted: July 3, 1947.

COMPLETE SPECIFICATION

Improvements in Telephone Relaying and Amplifying Means for the Aid of Deaf or like Persons

I, GERARD MICHAEL HORVITCH, of 120B, Pritchard Street, Johannesburg, Transvaal, Union of South Africa, a British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to means for relaying and amplifying telephone currents so as to enable deaf or like persons to hear, or to hear more perfectly, speech or other sounds transmitted by telephone.

The object of the present invention is to provide a relaying and amplifying means as stated, which can be readily applied to ordinary telephone receivers or ear pieces and used in conjunction with any type of high-gain hearing aid or amplifying unit.

According to the invention, I provide a telephone relay or pickup which comprises an electromagnetic, microphonic, piezo-electric or like instrument which is adapted to pickup the diaphragm vibrations, magnetic field variations or inductive effects of an ordinary telephone receiver or ear-piece, and to relay telephonic currents produced thereby to a high-gain hearing aid or other telephonic amplifier, and means whereby the said instrument can be readily and neatly attached to the exterior of the receiver or ear-piece, and is immediately ready for use without dismantling or interfering with the mechanism of the same.

In practice, the telephone relay or pickup may be constructed as a self-contained unit which can be placed against the protecting cover or cap of the receiver or ear-piece in adjacency to (and preferably concentrically with) the diaphragm thereof, and held in this position by means of an elastic band, an adhesive, or similar means.

In cases in which the relay or pickup comprises an electromagnetic instrument or transmitter, I may use a coil wound round a magnet, the field of which may be varied by the diaphragm vibrations or magnet field variations of the telephone receiver or ear-piece. Alternatively, in cases in which the pickup or relay operates by induction, I may use a coil which has an impedance matching that of the actuating coils of the receiver or ear-piece, and which is placed without a magnet or pole piece in the field of the magnet of the receiver or ear-piece.

In cases in which the converting or transmitting instrument consists of a microphone, crystal unit or the like, the relay or pickup may be supported on, or attached to, the telephone receiver or ear-piece by spring, rubber or other supports adapted to eliminate extraneous vibrations.

Pickup or relay devices embodying the invention will now be described, by way of example, with reference to the accompanying drawing, in which:—

Fig. 1 is a diagrammatic view of a pickup of an electromagnetic character according to the invention.

Fig. 2 is a diagrammatic view of a pickup of an inductive character according to the invention.

Fig. 3 is a diagrammatic view of a pickup of a microphonic or piezo-electric character according to the invention.

Referring to the drawing:—

The pickup shown in Fig. 1 comprises a magnet 1 and coil 2. The terminals 3 and 4 of the coil 2 are connected by leads 5, 6 the output terminals 7, 8. A non-magnetic casing 9 encloses the pickup and is made and shaped to be secured by an elastic band 9^a or other means over the centre of the cap 10 of an ordinary telephone receiver or ear-piece. The diaphragm 10^a of the receiver or ear-piece and the pickup are situated so that the field of the magnet 1 extends into the area of mechanical vibration of the diaphragm 10^a. The vibrations produced in the diaphragm 10^a by the transmission of speech or sound in the customary manner are thus effective to produce variations in the magnetic field of the magnet 1 and set up telephonic currents or impulses in the coil 2. These currents are transmitted through the leads 5, 6 to the output terminals 7, 8. Across these terminals, a high-grain hearing aid,

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or other telephonic amplifier (not shown) of known design, is connected. In this manner, an ordinary 'phone receiver can be adapted without any substantial difficulty or expense to enable a deaf person (using the said hearing aid or amplifier) to hear speech or sond over the 'phone with ease and convenience.

The use of the relay and amplifier as described does not involve tampering with the ordinary telephone equipment, and the pickup can be quickly fitted or removed by any unskilled person.

In Fig. 2, a pickup device is shown consisting simply of a coil 11, the impedance of which is matched to that of the coils 12 which are included in the telephone receiver for actuating the diaphragm 13. The pickup coil 11 is placed within the inductive field of the coils 12 so that the telephonic currents traversing these coils will induce corresponding telephonic currents or impulses in the coil 11. The terminals 14, 15 of the coil 11 are connected by leads 16, 17 to output terminals 18, 19 which may themselves be connected to the input of a high-gain hearing aid or amplifier (not shown).

The pickup device shown in Fig. 3 comprises a microphone or piezo-electric transmitter 20 which is supported by a rubber ring 21 adapted to be secured by vulcanisation, rubber solution or otherwise to the cap 22 of the telephone receiver or ear-piece 23. The microphone or piezo-electric unit 20 lies within the air column which is vibrated by the diaphragm 22^a within the receiver or ear-piece 23. The diaphragm vibrations produce variations in the resistance of a circuit containing carbon granules, crystals or the like 24, plates 25, 26, leads 27, 28 and a high-gain hearing aid or amplifier (not shown) connected in series with a battery or other suitable source of current, across the output terminals 29, 30. A deaf person using the hearing aid is thus enabled to hear speech and sound communicated to the receiver or ear-piece 23 in normal manner. The rubber support or ring 21 prevents extraneous vibrations from interfering with the efficient conversion of the diaphragm vibrations into the telephonic currents or impulses.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A telephone relay or pickup which comprises an electro-magnetic, microphonic, piezo-electric or like instrument to pick up the diaphragm vibrations, magnetic field variations or inductive effects of an ordinary telephone receiver or ear-piece, and to relay the telephonic currents produced thereby to a high-gain hearing aid or other telephonic amplifier, and means whereby the said instrument can be readily and neatly attached to the exterior of the receiver or ear-piece, and is immediately ready for use without dismantling or interfering with the mechanism of the same.

2. A telephone relay or pickup, as claimed in Claim 1, comprising a self-contained unit suitable to be placed against the protecting cover or cap of the receiver or ear-piece in adjacency to the diaphragm thereof and held in this position by means of an elastic band, an adhesive or similar means.

3. A telephone relay or pickup, as claimed in Claim 1 or 2, comprising a coil wound around a magnet, the field of which may be varied by the diaphragm vibrations or magnet field variations of the telephone receiver or ear-piece.

4. A telephone relay or pickup, as claimed in Claim 1 or 2, comprising a coil which has an impedance matching that of the actuating coils of the telephone receiver or ear-piece and which is placed without a magnet or pole piece in the field of the magnet of the receiver or ear-piece.

5. A telephone relay or pickup, as claimed in Claim 1 or 2, comprising a converting or transmitting instrument which consists of a microphone, crystal unit or the like which is supported on, or attached to, the telephone receiver or ear-piece by means of spring, rubber or other supports adapted to eliminate extraneous vibrations.

6. Telephone relays or pickups constructed and arranged substantially as described and illustrated in the accompanying drawings.

Dated this 28th day of November, 1944.

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Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1947. Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies, price 1s. 0d. each (inland) 1s. 1d. (abroad) may be obtained.

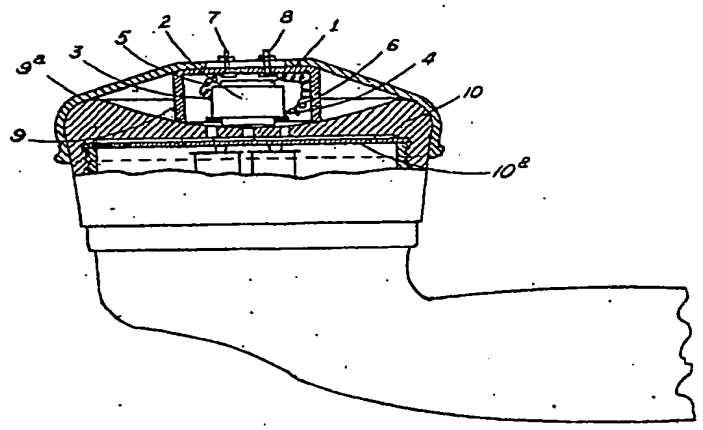

Fig. 1.

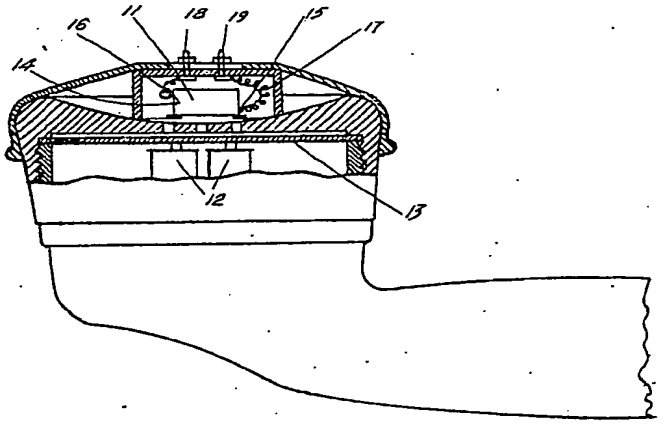

Fig. 2.

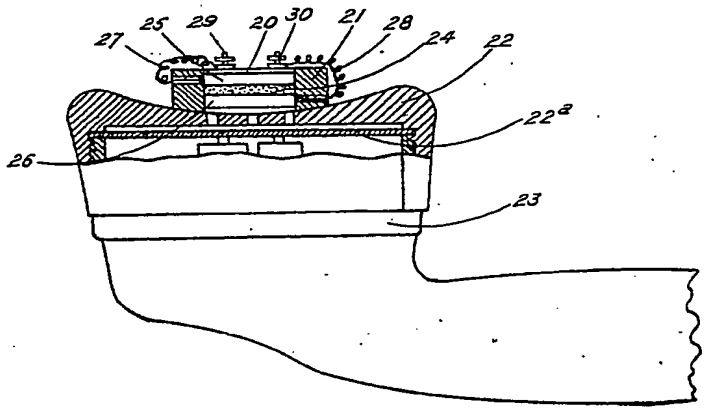

Fig. 3.